PLANT PROTECTION BULLETIN

A Publication of the
WORLD REPORTING SERVICE ON PLANT DISEASES AND PESTS

VOL. VI, No. 6 MARCH 1958

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ROME

FAO PLANT PROTECTION BULLETIN

is issued as a medium for the dissemination of information received by the World Reporting Service on Plant Diseases and Pests, established in accordance with the provisions of the International Plant Protection Convention, 1951. It publishes reports on the occurrence, outbreak and control of pests and diseases of plants and plant products of economic significance and related topics, with special reference to current information. No responsibility is assumed by FAO for opinions and viewpoints expressed in the Bulletin.

Manuscripts for publication, or correspondence regarding the World Reporting Service, should be addressed to Dr. Lee Ling, Plant Production Branch, Agriculture Division, FAO, Viale delle Terme di Caracalla, Rome, Italy; subscriptions and other business correspondence to the Distribution and Sales Section, FAO, Viale delle Terme di Caracalla, Rome, Italy.

The Bulletin is issued monthly in English, French, and Spanish, and twelve numbers, commencing with the October issue in each year, constitute a volume. Subscription rates are $ 3.00 or 15s. per annum; single numbers are priced at $ 0.30 or 1s. 6d. The citation is FAO Plant Protection Bulletin, or, in abbreviation, FAO Plant Prot. Bull.

MAN AND HUNGER

This pamphlet is mainly intended for teachers in secondary schools. It is hoped that it will help stimulate teachers' interest in the world problem of food and the work of the Food and Agriculture Organization. It is also hoped that it will supply teachers with useful data for the presentation of these subjects in the classroom. FAO, like the United Nations and the other Specialized Agencies, is becoming increasingly convinced that the public understanding necessary for the accomplishment of its tasks must start in the schools. This pamphlet, issued in co-operation with Unesco, is an outcome of that understanding. Criticisms, comments and suggestions are welcomed from all users. $0.25 or 1s.3d.

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The first issue in the same series *Nutrition and Society*, consisting of a lecture given by the late Professor André Mayer of France to inaugurate a course for nutrition workers at Marseilles in late 1955, a short biography of Professor Mayer and an account of FAO's work in the nutrition field, is still available from FAO Sales Agents or from Headquarters. $0.25 or 1s.3d.

FAO Plant Protection Bulletin

Vol. VI, No. 6 A Publication of the March 1958

World Reporting Service on Plant Diseases and Pests

Distribution and Prevalence of Potato Virus Diseases in Denmark

Ernst Gram

State Phytopathological Research Station, Lyngby

It is well known that in some districts potatoes degenerate quickly due to the attack of leaf roll and other prevailing virus diseases such as rugose mosaic, while in others it is comparatively easy to maintain a stock sufficiently vigorous for some years. Although experiments have confirmed this fact, there is still a strong need for further investigation.

In Denmark, the influence of geographic factors on the incidence of potato viruses had been investigated as early as 1915 to 1919, by growing a lot of healthy potato plants of variety Magnum Bonum together with a lot infected by leaf roll in each of the 12 experiment stations in the country. The widely varying incidence of virus diseases in different localities was attributed to the varying populations of aphids (2), a conclusion which was further verified by results obtained from experimental research work in the Netherlands.

In a later study on rugose mosaic, including infection experiments and aphid counts in several districts, the importance of aphids in the spread of the disease was strongly indicated (3).

Influence of Local Conditions on the Incidence of Virus Diseases

As a further step toward determining more accurately the distribution and prevalence of potato viruses in the country, which constitute a problem of basic importance to seed potato production, healthy potatoes of variety Bintje were distributed in 1950 to 355 farms throughout the country, where they were grown for five years without rogueing. During this five-year period, a sample of 200 tubers was collected every autumn from each of these farms and grown in a demonstration field open to inspection. Rugose mosaic was the first to appear. But in the third year leaf roll was suddenly found to be widespread, especially in the southern part of the peninsula, whereas rugose mosaic was predominant especially in the samples from islands.

After its sudden increase in 1952, the disease incidence remained in most cases fairly constant, although in some localities it became more widespread. The number of diseased plants decreased only on a few farms, probably because infected tubers, too small for planting, were actually insufficiently represented in the samples. The distribution of these farms, together with the percentage of diseased plants (leaf roll and rugose mosaic combined) found in 1951 is given in Figure 1. At later stages of the experiment, the growing of potatoes in some farms for this purpose had to be discontinued due to frost injury and other reasons, leaving a total of 195 farms after five years. Table 1 summarizes the disease incidence (leaf roll and rugose mosaic combined) in five representative farms during the five years under test, as shown by the results obtained from the demonstration field. As indicated, the extent of virus infection and the rate of increase are extremely variable in these five widely separated localities. Farm 278, where the virus diseases were most prevalent and increased most rapidly, represented a very unfortunate type of locality, being situated on the outskirts of a town where there was extensive private and commercial gardening.

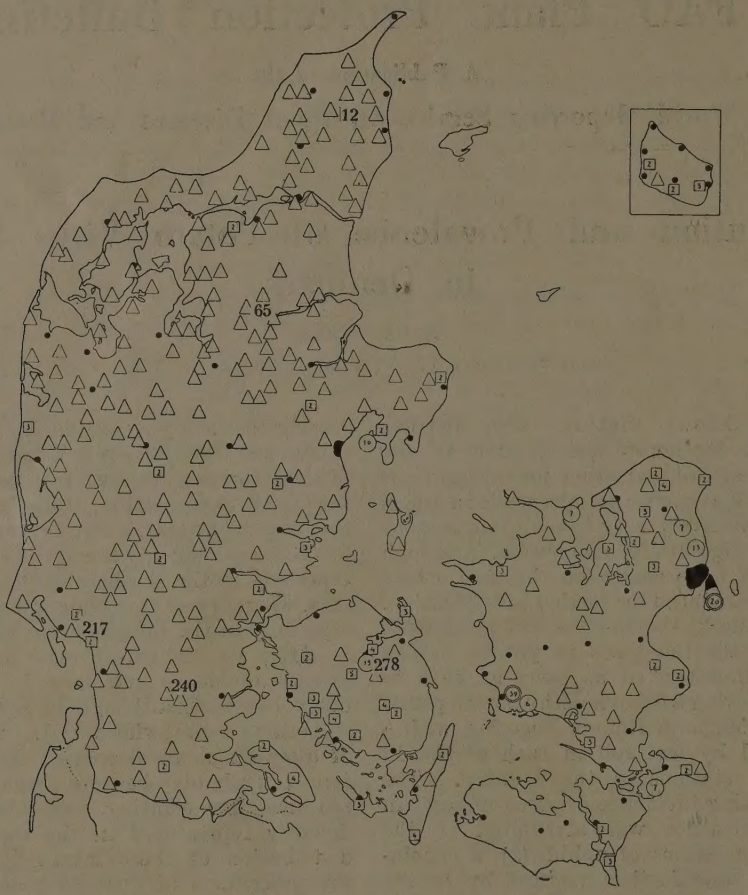

Figure 1. Distribution of farms where the spread of virus diseases of potato was investigated and the disease incidence (leaf roll and rugose mosaic combined) found in 1951, Denmark. Symbols used to indicate the extent of disease infection, with figures inside the symbols showing the actual percentages of diseased plants, are as follows:

△ 0-1.0% □ 1.1-5.0% ⊙ 5.1-15.0% ◎ 15.1% or more

Effect of Virus Infection on Potato Yield

In order to determine the effect of virus infection on potato yield, experiments were carried out using all samples of potatoes showing more than 1 percent virus infection obtained from the experiment mentioned above, together with 22 samples selected from 130 samples which had shown less than 1 percent infection during the five-year period.

For purposes of comparison, two lots of Bintje potatoes, one disease-free and another with 100 percent infection of leaf roll, were added. Tubers used were 35 to 45 millimeters in size, weighing an average of 50 grams each. The seeding rate was 36,000 tubers (1,800 kg.) per hectare. Plants with visible virus infection were counted during the summer and yields were determined on the basis of five replicated plots of 22.4 square meters each. From the results given in Table 2, as well as in Figure 2, a correlation

TABLE 1. – *Incidence of leaf roll and rugose mosaic in potatoes grown on five farms in Denmark from 1950 to 1954 without rogueing; samples of potato tubers were collected each year from these farms and grown in a demonstration field for inspection.*

Farm number*	Percent diseased plants in the demonstration field				
	1950	1951	1952	1953	1954
65	0	0	0	0	0
12	0	0	0	0.5	1.5
217	0	0.5	1.5	3.0	11.5
240	0	0	8.5	7.5	13.3
278	5.0	15.0	26.5	88.0	91.8

* Locations of the farms are given in the map in Figure 1.

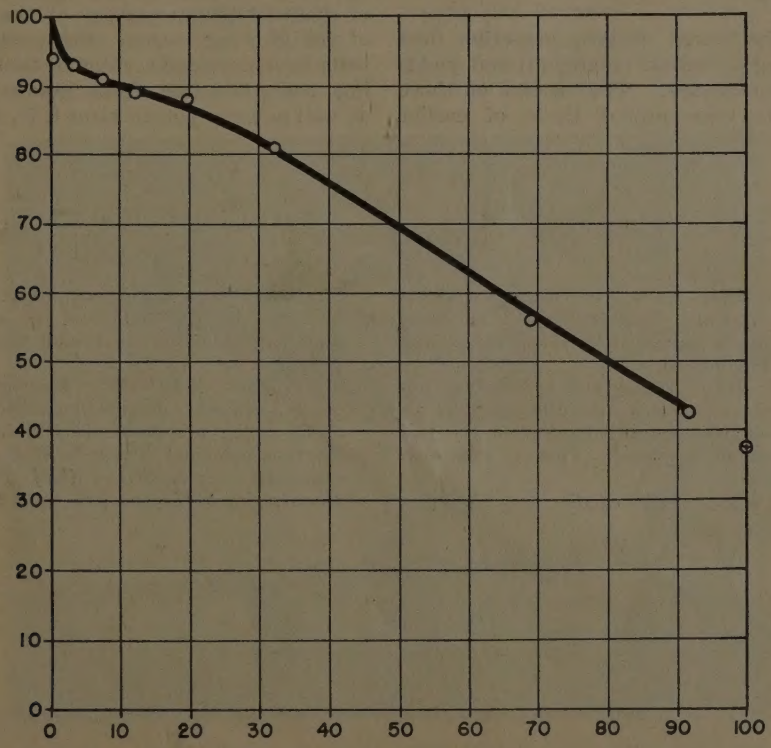

Figure 2. Correlation between virus infection (leaf roll and rugose mosaic combined) and potato yields.

TABLE 2. – *Correlation between virus infection (leaf roll and rugose mosaic combined) and potato yields, as shown by field experiments using 82 samples of tubers with various degrees of infection.*

Number of samples	Average percentage of plants infected	Relative yield (healthy = 100)
16	0.4	94
20	3.2	93
10	7.6	91
10	12.3	89
13	19.8	88
7	32.1	81
2	69.0	56
3	91.4	43
1	100.0	38

between the extent of virus infection (leaf roll and rugose mosaic combined) and yields is clearly indicated. The results of these experiments corroborated those of earlier investigations and provide a detailed knowledge on localities suitable for the propagation of seed potatoes for use by the Potato Seed Board, the promoter of these investigations.

Potato Virus X

Potato mottle (potato virus X) is also of common occurrence in certain varieties in Denmark. Although it is harmful to potato production, virus X represents a problem different from that of leaf roll and rugose mosaic, as it is spread by contact but not by insect vectors. The infection of certain strains of potato virus X is more or less latent. While this virus has been the object of investigations at the government experiment stations, localities where the virus has spread extensively have not yet been found in Denmark. In practical seed potato production, the increase of infection of virus X appears to depend mainly upon the number of diseased plants present at the beginning of the growing season. Fortunately, serum tests have provided a valuable tool for selecting pedigrees free from potato virus X, as well as from potato virus S (1, 4).

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A Homemade Bellows Duster for Small Farmers

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MANY farmers in countries which are in the process of being developed, as well as many home gardeners in more developed countries, have not been able to share the benefits of modern insecticides because of the high cost of application equipment. These people are willing to sacrifice efficiency for an inexpensive product.

A low-cost bellows duster as illustrated in Figure 1 and its construction are described in the present article. This duster has been developed in Indonesia under the U.S. International Cooperation Administration program in economic entomology. Samples of this duster have been given to Indonesian agricultural extension agents for distribution to farmers and village carpenters. Within a period of a few months, thousands of dusters were made in the village shops and sold at a cost of four kilograms of rice; many have been made by farmers themselves at a cost of only 1 kilogram of rice.

Farmers are now using these dusters to apply insecticides to their rice seedbeds, vegetable crops, and even to rat holes, for the control of that pest. A farmer with a seedbed large enough for 1 hectare of rice will require less than one hour to treat the field; most of the farmers do it in about one-half hour. On an average, a little more than 1 kilogram of dust can be delivered with this duster in an hour.

All the materials required for making these dusters are readily available in villages with a supply of kerosene. Insofar as auto tubes are concerned, many Indonesian villages which are without automobiles will have to import used tubes from the larger cities

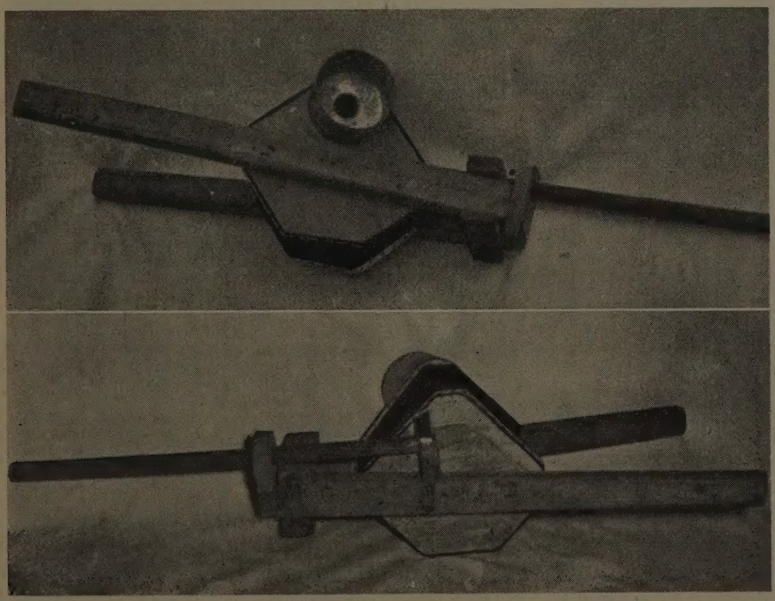

Figure 1. A homemade bellows duster, for a right-hand operator, showing views from both sides.

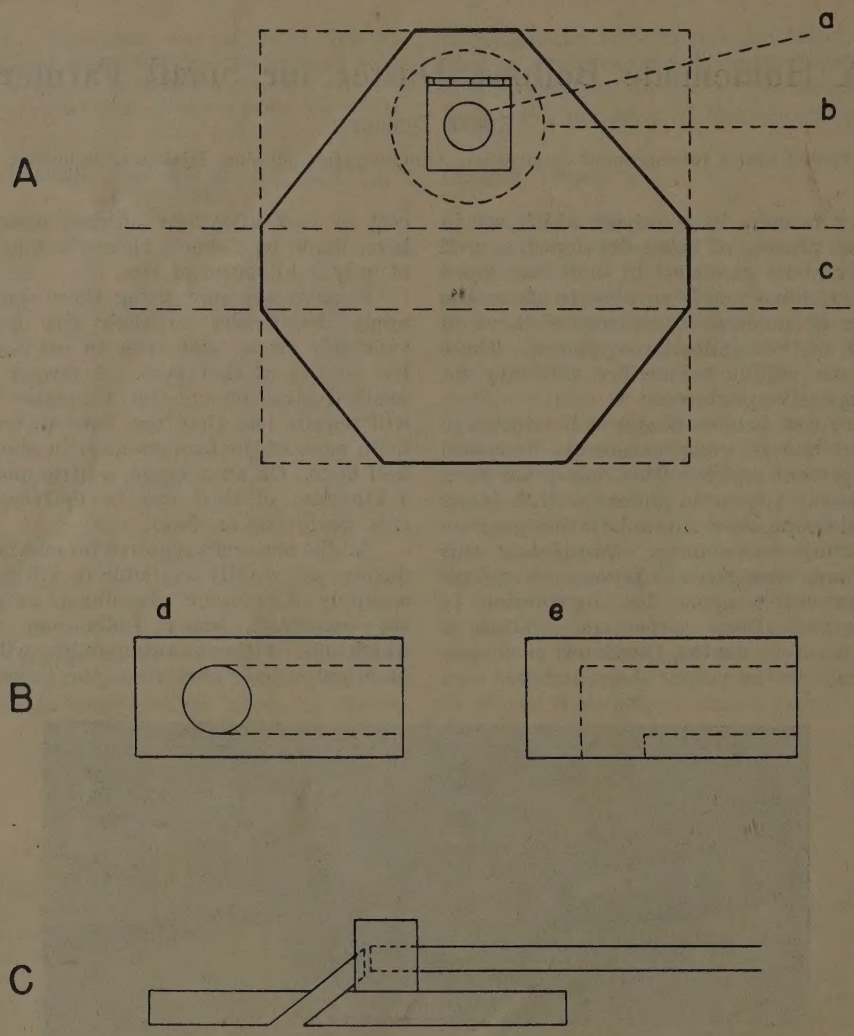

Figure 2. Patterns for making wooden pieces for the duster. A. Sideboard for the bellows which should be cut from a wood piece 1-2 cm. thick and about 17 cm. square, and on which a flap valve *(a)* is to be affixed on its inner surface, and a ti can *(b)* with a hole at the bottom and a handle *(c)* affixed on its outer surface. On the other sideboard a hole is to be made for the outlet tube. B. Rear tube housing block showing the position of the hole from side view *(d)* and top view *(e)*. C. Rear tube housing block with a slanted opening for the outlet tube, which can be made by farmers without a drill.

in their area. Any other equipment needed to construct the dusters can be found locally either as a product or a common by-product.

Experience indicates that the rubber tubing used on these dusters will last for more than six months before needing replacement. The rubber tubing from a jeep or a regular passenger car is much better than that from a truck, because the former will make the duster lighter and less tiring to use. Very

light wood is preferable and, incidentally, in this area, this variety is the cheapest.

In the tropical countries bamboo tubing is usually available in the villages. The thin-walled kind is recommended for making the discharge or outlet tube of the duster. If bamboo tubing is not available, thin sheet metal from used food containers can be flattened and then rolled into a tube of the preferred diameter. The rolled sheet metal tube is lighter (Figure 3 A); it is considered by some to be better than a bamboo tube of the same size.

Most of the outlet tubing mentioned in this description is 2 centimeters in diameter; the selection of the diameter of the tubing depends on local availability of tools used for boring. The boring can best be done with a brace and bit; if this is not available, it can be done by burning with a red hot poker or even drilling with a small knife blade.

The first model of this duster was made with round side discs. It was found that this was difficult to cut insofar as the farmers or even the carpenter shops were concerned. A change to this straight-sided model was made. This model, if made with light wood and a jeep tube, will weigh a little less than 1 kilogram when complete.

The circumference of the wooden sides of the bellows has to be altered to fit the variations in the size of the rubber tubing used. The wood should have a circumference 3 to 6 centimeters longer than the auto tubing. Only the wooden sides and the length of the metal binding strips need to be changed in accordance with the size of tubing used.

A right-handed man will usually prefer to have the outlet tube on the left side; a left-handed man will prefer the opposite. Directions for construction with jeep tubing for a right-handed man are given below in detail. All measurements are in centimeters. It is hoped that working models can be made from these directions by agricultural leaders. Demonstration models are far better than any written instructions for village workers.

Wood Pieces

Side boards of the duster are of wood 1 to 2 centimeters thick; for use with a jeep

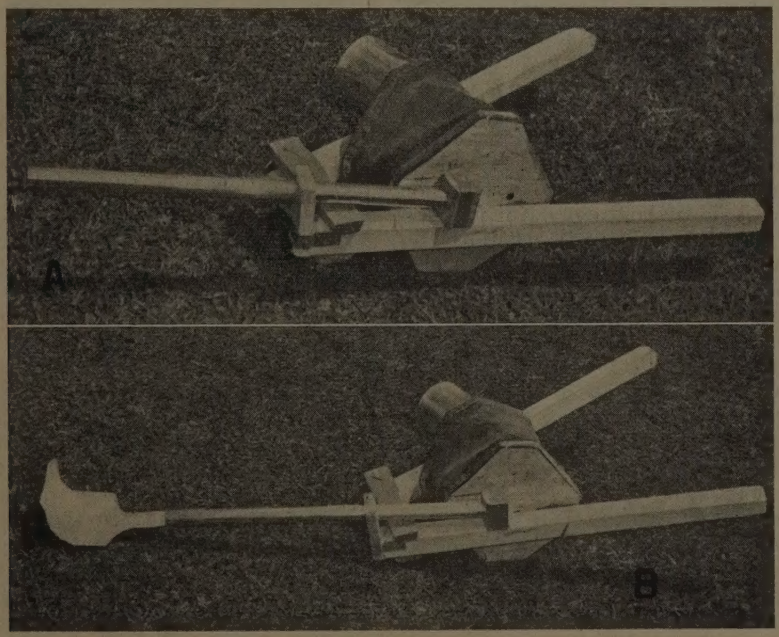

Figure 3. A. bellows duster with a metallic outlet tube. B. The duster with a deflector scoop attached.

tube the side boards should be about 17 centimeters square. Figure 2A shows the pattern for cutting these pieces. The inside surfaces should be smoothed, especially near the flap valve.

Rear tube housing blocks can be mass-produced according to Figure 2B, if a drill is available. For farmers who make this duster without standard drills, the pattern in Figure 2C with the slanted opening will probably work somewhat more efficiently.

The handles are pieces of wood about 45 × 3.5 × 2.5 centimeters. Longer handles make the work more tiring. The handles can be smoothed and the edges bevelled to make gripping more comfortable.

Three blocks 10 × 2.5 × 1.0 centimeters are needed for the front pieces. Two of these are axle housings; the third is the front tube housing. The front tube housing hole should be larger than the tube to be used; a " V " notch at the side of the hole will allow for the placement of a small wedge.

Rubber Pieces

The flap valve is a small rectangular piece of rubber cut from the tread portion of the tube, to be affixed on the inner surface of the side board. It is nailed only at its top because it is intended to flap and permit entry of air or dust. When the bellows is pumped, the flap will close automatically.

The rubber piece for the bellows should be cut as a sector from the auto tube, with the angles on both sides about equal. If patches are on the used tube, they will not interfere with the working of the bellows. The circumference of the tubing should be about 3 to 5 centimeters less than that of the side pieces. The small nails used to fasten the bellows should be about 1 centimeter apart.

Goat skin has been used as a substitute for the rubber tubing. As far as a workable bellows is concerned, it is satisfactory. However, it is not recommended for the following reasons: *a*) it is more expensive to purchase; *b*) more labor is required to sew it up to form a tube; *c*) unless it has been properly tanned, it gets stiff when it dries and must be wetted (from the outside) before use after even short periods of nonuse; *d*) in most places of storage the goat skin will be subject to rat gnawing which will make maintenance very expensive.

Metal Pieces

A small tin can, such as is used for canned milk or cigarettes, makes an adequate dust funnel, which is to be affixed on the outer surface of the side board opposite the flap valve. A hole about 2 centimeters in diameter is made in the bottom but does not necessarily have to be in the center. If too small a hole is used, loading the duster is more difficult. This tin should not be covered; farmers who do not understand the working of the flap valve put a cover on the loading can. The duster will not operate properly with a cover on the can.

The outlet tubes can be made from thin metal sheets, such as used food tins; these tubes can also be made from thin-walled bamboo.

The bellows is secured to the side pieces by thin strips, for which usually metal is used, though some farmers have used rattan. The axles, which permit movement of the handles, are nails bent at the end, or holes can be drilled in the two front wooden pieces and the handles and baling wire used.

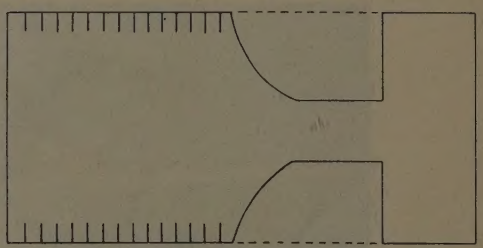

Figure 4. Pattern for making the deflector scoop for attaching to the outlet tube of the duster.

Assembly

The flap valve, the rear tube housing block, the loading funnel tin and the handles are to be nailed in place before the bellows tubing is nailed in place. The front tube housing block is nailed to the left handle before being attached to the side board.

The bellows tube is stretched evenly over the side pieces before being nailed in place. After the bellows tubing is nailed, then the axles should be placed in position. Some people make only one of the axle positions moveable.

The outlet tube is put in position and secured with a wedge. The dusters in the illustrations do not have a wedge but the front tube housing is very tight and it is difficult to place the tube in position. If the rear tube housing opening is a little large, the dust leakage from this point can be reduced by wrapping the tube with thread, string, or even rubber bands.

Use of Duster

The duster is used with the loading tin and outlet tube above the handle (Figure 5A). To load the duster, it is to be placed on its side with the loading tin up; up to 200 cc. of dust can be added at one filling. A stick may be used to open the flap valve, if necessary. By tapping the duster, the dust will fall in.

For rapid dusting of a large field, the dust should be applied when there is a light breeze. If the operator stands with his back to the breeze, the air currents will carry the dust across the field. Two kilograms per hour can be applied by this method. Ten kilograms or more are usually required per hectare. It is preferable to apply the dust when the plants are still wet from rain or dew.

Accessories

Outlet tubes of various lengths may be used. The very short tube is generally used for treating rice seedbeds and field crops; the longer one is used for treating small trees and rat nests. The longer tube is also used with a deflector scoop attached for treating the underside of leaves, such as cabbage (Figures 3B, 5B). Figure 4 gives a pattern for making the scoop.

Figure 5. The bellows duster in use. A. Without attachment for ordinary use. B. With a deflector scoop attached for dusting the underside of leaves of certain crops, such as cabbage. Note the amount of dust being discharged and the angle of discharge.

Figure 6. A bellows duster with an atomizer sprayer attachment, adopted for use as a house sprayer.

Figure 6 shows the duster with an atomizer spray attachment. With this attachment slipped over the end of the outlet tube, it can be used in the house to apply mosquito sprays and wettable powder residual sprays to inside walls.

Figure 7 shows an attachment for use of the bellows as a hive smoker. Farmers should be reminded that a single duster cannot be used for both hive smoking and applying insecticides.

For rat control, 1 percent endrin dust may be used. A long outlet tube is put into the rat nest and a few puffs are blown in. The dust settles on the rats in the nest or will be picked up on their fur when they move. This treatment is most effective during the dry season but can be considered only effective for control of females, because the LD 50 for the female is 5 mg./kg., and that for the male, 45 mg./kg.

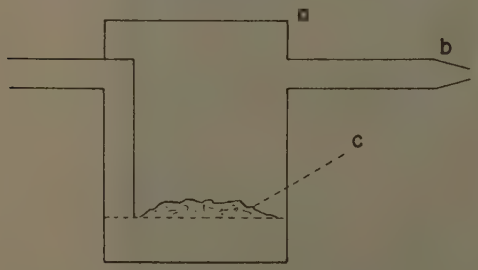

Figure 7. An attachment for the bellows duster to be used as a hive smoker. It can be made of a tin can with a removable cover *(a)* and an outlet tube *(b)*. Inside the can a wire screen of 1 cm. mesh *(c)* is placed above the bottom, on which burning cloth will produce smoke.

Summary and Discussion

This paper describes how to make and use a low-cost bellows duster. This duster weighs less than 1 kilogram, can be made of native materials or common by-products, and is efficient enough to be a useful tool for farmers dependent on less than 1 hectare of land. It can be made by the farmers or by village carpenters. Several attachments are mentioned: a deflector for treating the underside of cabbage leaves, an atomizer type sprayer and a hive smoker. With 1 percent endrin this duster may be used for the control of field rats.

This duster has been readily accepted by the farmers in Indonesia and is being produced in ever-increasing numbers. Its acceptance by the farmers has made possible the initiation of a program to introduce insecticide treatments to the average low-income farmer who never previously used insecticides.

In duplicating these dusters, the farmers and village carpenters have continually made innovations, many of which represented improvements. This will be encouraged, so that worthwhile improvements may be introduced to produce better models.

Outbreaks and New Records

India

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Citrus Decline in Bombay State

CITRUS cultivation is the most important fruit industry in India and occupies the largest acreage in the composite Bombay State. The crop has long suffered from "die-back" and "decline" diseases but in recent years the "decline" has become widespread and is assuming alarming proportions.

During a survey of virus diseases of plants in the Bombay State in 1955-56, citrus plantations were examined and some diseased trees of Mosambi sweet orange (*Citrus sinensis* var. *mosambi*) were found to show symptoms similar to those caused by virus diseases. The affected trees were partially defoliated and their leaves showed vein-clearing, chlorotic vein-banding of the midrib and major lateral veins, and yellowing. Leaves were often curled, in a semi-arid condition and rough to touch. Some such trees were either blossoming heavily or laden with a heavy crop of fruits, and they were also observed to collapse all of a sudden within a couple of days.

Figure 1. Seedling of Standard sour lemon budded with diseased Mosambi orange, showing complete yellowing of leaves and stunted growth. A healthy seedling of the same variety at right.

Figure 2. Sour orange grafted with a shoot of diseased Mosambi orange, showing curling and yellowing of leaves and defoliation on terminal twigs.

The disease of the Mosambi orange was successfully transmitted by budding or grafting to seedlings of standard sour lemon (Figure 1), sour orange (Figure 2) and West Indian Key lime under insect-proof conditions. The symptoms produced in these citrus species were similar to those induced by tristeza or quick decline virus in other countries.

Besides Mosambi sweet orange, trees of Kagzi lime (*Citrus aurantifolia*), grapefruit (*C. paradisi*) and sangtra (*C. reticulata*) were also observed to be affected by "decline" or "dieback." Intensive studies on all these diseases are under way.

Israel [1]

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Meloidogyne javanica in Strawberry Roots

STRAINS of strawberry varieties Kurume and Myazadi from Japan were introduced into Israel two years ago by the Vegetable Division of the Agricultural Research Station. After quarantine inspection the plants were stripped of leaves and roots and planted in a nursery, where the soil was apparently infested with root-knot nematodes. The plants survived the drastic operation and, after two transplantings, they were finally grown as mother plants in the Field Station at Vilath, near B'er Sheva. The field was free from root-knot nematodes. As these two varieties did not reveal any advantages over the locally grown strawberries, the field was then abandoned, with plants growing into a thick cover. Later, inspection of this abandoned field revealed spots of chlorotic, stunted or dwarfed plants. When plants were removed from such spots, roots of some of them were found knotted.

Strawberry was hitherto known to be infected by only one species of root-knot nematodes, i.e., *Meloidogyne hapla*. As the perineal pattern of the adult female is a character used for differentiation of species of *Meloidogyne*, collection from every source has been examined in order to determine possible variations in patterns of different species. In examining the nematode from these knotted strawberry roots, it was discovered that the perineal pattern was typical of *Meloidogyne javanica*, [2] which was not known previously as a parasite of strawberry. Whether this is a local parasite infecting a susceptible variety or a new strain of *M. javanica*, is being investigated.

[1] Publication of the Agricultural Research Station, Rehovot, Israel. 1958. Series No. 215-E.

[2] TAYLOR, A.L., V.H. DROPKIN AND G.C. MARTIN. 1955. Perineal patterns of root-knot nematodes. *Phytopathology 45* : 26-34.

United States

Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture

Status of European Corn Borer in 1957

AGRICULTURAL agencies in 24 states reported on surveys conducted to determine the abundance and distribution in 1957 of the European corn borer, *Pyrausta nubilalis* (Hbn.). Based on comparable districts surveyed,the average number of borers per 100 plants for the country as a whole rose from 112 in 1956 to 170 in 1957. There was a decrease in the eastern states, from 186 to 104 borers per 100 plants; while the north central states, the main maize-producing area, showed an increase from 102 to 178 borers per 100 plants.

The spread of the pest continued to the south during the year with five states (Alabama, Arkansas, Louisiana, Mississippi, South Carolina) reporting a total of 29 newly infested counties. The most notable spread involved the northeast area of Louisiana. Although *Pyrausta nubilalis* was reported in Louisiana in 1948, surveys failed to disclose additional specimens until 1957.

Plant Quarantine Announcements

Ceylon

Plant Protection (Amendmcnt) Act, No. 50 of 1957, published as a supplement to the *Ceylon Government Gazette*, Part II, of 8 November 1957, modifies the Plant Protection Ordinance No. 10 of 1924. The modifications mainly refer to the definition of the term "Director" and administrative procedures.

Nicaragua

Decree No. 263 published in *La Gaceta*, Vol. 61, No. 240 of 23 October 1957, prohibits the importation of the following plants.

1. Cacao plants and parts thereof, including cuttings, buds, fruit and seed from Panama, where the occurrence of *Monilia* pod rot (*Monilia roreri*) has been reported.
2. Banana plants or part thereof, including shoots, rhizomes and fruit from Honduras where the occurrence of bacterial wilt (*Pseudomonas solanacearum*) has been reported in the Department of Cortés.
3. Citrus plants and parts thereof, including cuttings, buds, fruit and seed from El Salvador, because of the occurrence of psorosis virus in that country.

The measures mentioned above will be abolished as soon as there is satisfactory evidence that these diseases no longer occur in the respective countries.

Peru

Supreme Resolution No. 219 of 3 October 1957, published in *El Peruano*, No. 4963, on 16 October 1957, prohibits the importation of seed potatoes and potatoes for consumption or other purposes, except where imported for experimental purpose by an official institution and subject to approval by the Plant Protecton Council.

The new resolution supersedes Supreme Resolutions No. 72 of 17 April 1925 and No. 88 of 22 May 1925.

Territory of Papua and New Guinea

A notice of 22 November 1957 under the title of Prohibition of Importation, published in the *Papua and New Guinea Gazette*, No. 60, on 28 November 1957, provides regulations governing the importation of plants of hevea rubber, in accordance with the provisions of the Plant Protection Agreement for the Southeast Asia and Pacific region.

1. Importation of plants or parts thereof of the genus *Hevea* from any place outside the Southeast Asia and Pacific region is prohibited, unless:

   a) it is made for scientific purposes and the consignment is addressed to the Director, Department of Agriculture, Stock and Fisheries at Port Moresby;
   b) written permission has been granted by the chief quarantine officer, subject to such conditions specified therein; or
   c) each consignment is accompanied by a certificate issued by a competent authority in the country of origin, certifying that the plants have been disinfected and are free from original soil and pests and diseases.

2. Importation of any plant of *Hevea* capable of further growth or propagation (other than seed) from the American tropics or any other country declared by the administratoris prohibited, unless:

   a) the certification requirement has been met;
   b) the plants have been grown under quarantine at an approved intermediate station for a specified period; and
   c) the quarantine treatment is duly certified by the officer in charge of the intermediate station.

3. Importation of any seed of a member of the genus *Hevea* from the American tropics or from any other declared country is prohibited, unless, in addition to the requirements listed under paragraph 1, the seed is certified by a competent authority at an intermediate place to have been examined, found free of diseases and pests, disinfected and repacked in new packings.

4. Importation of plants or parts thereof of *Hevea*, not capable of further growth or propagation, is prohibited, unless, in addition to the requirements listed under paragraph 1, the chief quarantine officer is satisfied that the plants are required for scientific purposes and that they were sterilized in the country of origin in an approved manner.

5. Importation of any plant other than *Hevea*, capable of growth or propagation and originating in the American tropics or any other declared country, is prohibited unless it is authorized by the chief quarantine officer, subject to the specified conditions.

Turkey

Under the terms of Act No. 6968 of 1957, a list of plants and diseases and pests, the importation and transit of which are prohibited, was published in the *Resmî Gazete*, No. 9766, on 26 November 1957.

Plants and Goods Prohibited

All plants and packing materials liable to carry pests and diseases may not be imported without quarantine clearance. The importation of the following specified plants, including parts of plants and specified goods, is prohibited regardless of their origin, except when imported for scientific purposes with prior permission of the Ministry of Agriculture.

Vines (*Vitis* spp.) plants and parts thereof
Cotton (*Gossypium* spp.)
Okra (*Hibiscus esculentus*)
Citrus (*Citrus* spp.)
Stone fruits (*Prunus* spp.)
Pome fruits (*Pyrus, Cydonia*)
Plants of subfamilies Aurantioideae, Rutoideae and Toddalioideae of Rutaceae
Dodders (*Cuscuta* spp.)
Barberries (*Berberis* spp.)
Logs or lumbers with bark attached and nondried, logs or lumbers, with bark and heat-dried, of *Castanea, Acer, Quercus, Fagus* and *Rhus*, and their manufactured products
Soils of all kinds, including soil adhering to plants
Fresh manure

Diseases and Pests Prohibited

Agrobacterium tumefaciens
Corynebacterium sepedonicum
C. michiganense
Pseudomonas mors-prunorum
P. pisi
P. savastanoi
P. marginata
P. syringae
Xanthomonas vesicatoria
X. phaseoli
X. citri
X. hyacinthi
Erwinia amylovora
E. carotovora
Plowrightia morbosa
Nectria galigena
Endothia parasitica
Phytophtora cambivora
P. fragariae
Deuterophoma tracheiphila
Phoma citricarpa
Corticium salmonicolor
Chalara quercina
Graphium ulmi
Synchytrium endobioticum
Spongospora subterranea
Fusarium oxysporum f. *gladioli*
Sclerotinia gladioli
S. bulborum
Sclerotium tuliparum
Urocystis tritici
Tilletia brevifaciens
T. secalis
Helminthosporium victoriae
Prunus spp. viruses
Pirus spp. viruses
Quick decline, psorosis and other citrus viruses
Barley stripe mosaic
Beet leaf curl and other viruses
Pierce's disease (= lucerne dwarf)
Lettuce mosaic
Rose wilt and other viruses
Elm phloem necrosis
Anastrepha ludens
Dacus dorsalis
D. cucurbitae
Eumerus strigatus
Merodon equestris
Rhagoletis pomonella
Conotrachelus nenuphar
Epitrix cucumeris
Leptinotarsa decemlineata
Popillia japonica
Trogoderma granaria
Anthonomus grandis
Iridomyrmex humilis
Gnorimoschema operculella
Hyphantria cunea
Laspeyresia funebrana
L. molesta
Piesma quadrata
Aphididae
Aleurocanthus woglumi
Ceresa bubalus
Chrysomphalus aonidum
Coccomytilus halli
Empoasca fabae
Hemiberlesia ceardi
H. longispina
Quadraspidiotus perniciosus
Metatetranychus ulmi
Tarsonemus spp.
Tetranychus viennensis
Ditylenchus spp.
Heterodera spp.
Meloidogyne spp.
Pratylenchus spp.
Aphelenchoides spp.

Uganda

The Plant Protection (Fumigation of Imports) (*Trogoderma granarium*) Order, 1957, published in the Supplement to *Uganda Gazette*, on 16 May 1957, provides that the importation of all grains and flours, edible oilseeds, pulses, beans, coconuts, copra, oilcakes, fresh fruit or cloves from India, Pakistan, Burma, Siam or Zanzibar is prohibited unless with a certificate to the effect that:

a) they have been fumigated within seven days before the shipment or on board of the vessel or other means of conveyance; or
b) they have been fumigated before leaving the wharf of the port of entry into Kenya or Tanganyika; or
c) they have been inspected at the place of entry into Kenya, Tanganyika or Uganda and have been certified free from *Trogoderma granaria*.

If found infested with *Trogoderma granaria*, the above-mentioned imported articles may be required to be fumigated or treated with insecticide, whether fumigated before shipment or not, or to be destroyed. Any vessel or other means of conveyance, building or place which is used for the transport or storage of such articles, may be required to be fumigated or treated, if suspected of being infested. Where fumigation is prescribed, treatment with methyl bromide at 3 pounds per 1,000 cubic feet of space for at least 24 hours, or hydrogene cyanide (not for foodstuff) at 12 ounces per 1,000 cubic feet of space should be used. Where insecticide treatment is prescribed, a drenching spray of malathion or of malastin emulsifiable concentrate containing 40 percent of malathion should be used.

Union of South Africa

Proclamation No. 239 of 29 July 1957, published in the *Government Gazette*, No. 5928, on 16 August 1957, prohibits the introduction of any plant belonging to the genus *Manihot* from Kenya, Tanganyika, Uganda, Nyasaland, Portuguese East Africa, or any other country where the virus disease known as cassava brown streak or cassava stem lesion (*Manihot* virus 2) occurs.

Proclamation No. 309 of 21 September 1957, published in the *Government Gazette*, No. 5953, on 4 October 1957, declares seed of citrus plants (*Citrus* spp.) to be a plant for the purpose of the Agricultural Pest Act 1957 (see *FAO Plant Prot. Bull. 6* : 45-46. 1956). For the importation of seed of citrus plants from overseas, a written permit of the Department of Agriculture specially authorizing the introduction is required. In the 1957 Act, " plant " is defined as to mean any tree, shrub or vegetation, and the fruit, leaves, cuttings or bark thereof, including any living portion of a plant, and any dead portion or any product of a plant which has by proclamation been declared to be a plant, but excluding any seed unless the seed is specially mentioned in the Act or has been declared to be a plant.

News and Notes

Weaver Birds in Tropical Africa

Grain-eating weaver birds of the genus *Quelea* are ranked as one of the most serious pests in tropical Africa. In some areas the population of these birds appears to be on the increase and represents a veritable menace to the food supply of the people. The great losses caused by them have long been recognized but efforts to reduce losses have been handicapped by insufficient knowledge on the biology of the birds.

Until recently the control of weaver birds was effected mainly by blasting in their dry season roosts. Investigations on the migration of these birds indicate, however, that in order to prevent crop losses effectively birds must be killed in their nesting sites.

Due to the wide geographic distribution of the various species of *Quelea* and their migratory habits, any basic research on biology for the purpose of developing adequate means of control must be undertaken on an international level. In recognition of this fact, the Scientific Council for Africa South of the Sahara convened, in November 1955, a technical meeting on the *Quelea* birds in Dakar, French West Africa and, in July 1957, a symposium on *Quelea* birds in Livingstone, Federation of Rhodesia and Nyasaland.

During the Ninth Session of the FAO Conference held in November 1957, representatives of governments of various African territories stressed the need for developing methods for the control of weaver birds and a resolution was adopted to inaugurate a regional project on the study of these birds through the establishment of a special fund. As a first step toward implementation of this project, an over-all survey of *Quelea* birds in Africa will be undertaken at the earliest possible date.

Roma, 1958 — Tipografia del Senato del Dott. G. Bardi

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